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ABSTRACT

Embedded systems bring special purpose computing power to consumer electronics devices players and pagers. Java is being aggressively targeted at such systems with initiatives such as Micro Edition, which introduces certain efficiency optimizations to the Java Virtual Machine. It is identified as an important future goal for ensuring Java's success on embedded systems [20] that processing power and timing constraints often make traditional compression techniques untenable. We must meet the conflicting requirements of size reduction and execution performance. We present a new file format for Java binaries that achieve significant size reduction with little or no performance penalty. Tests conducted on several large Java class libraries show a typical 25% size reduction for class files and 10% for JAR files.

↑ REFERENCES

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- 1 David F. Bacon , Peter F. Sweeney, Fast static analysis of C++ virtual function calls, Proc SIGPLAN conference on Object-oriented programming, systems, languages, and application: 06-10, 1996, San Jose, California, United States
- 2 Quetzalcoatl Bradley , R. Nigel Horspool , Jan Vitek, JAZZ: an efficient compressed form: Proceedings of the 1998 conference of the Centre for Advanced Studies on Collaborative res 30-December 03, 1998, Toronto, Ontario, Canada
- 3 [3] L. R. Clausen, U. P. Schultz, C. Consel, and G. Muller. Java bytecode compression for Technical Report 1213, Institut de Recherche en Informatique et Systèmes Aléatoires, Dece
- 4 Jason David Corless, Compression of Java class files, University of Victoria, Victoria, B.C.
- 5 Thomas M. Cover , Joy A. Thomas, Elements of information theory, Wiley-Interscience, 1
- 6 [6] M. Dahm. JavaClass API 3.1.2. <http://www.inf.fuberlin.de/~dahm/JavaClass/>.
- 7 Jeffrey Dean , David Grove , Craig Chambers, Optimization of Object-Oriented Programs Analysis, Proceedings of the 9th European Conference on Object-Oriented Programming, p.7
- 8 Jens Ernst , William Evans , Christopher W. Fraser , Todd A. Proebsting , Steven Lucco, (Proceedings of the ACM SIGPLAN 1997 conference on Programming language design and im June 16-18, 1997, Las Vegas, Nevada, United States
- 9 James Gosling , Bill Joy , Guy L. Steele, The Java Language Specification, Addison-Wesley Inc., Boston, MA, 1996
- 10 R. Nigel Horspool , Jason Coriess, Tailored compression of Java class files, Software&m v.28 n.12, p.1253-1268, Oct. 1998
- 11 Thomas Kistler , Michael Franz, A Tree-Based Alternative to Java Byte-Codes, Internati Programming, v.27 n.1, p.21-33, Feb. 1999
- 12 Burton H. Lee, Embedded Internet Systems: Poised for Takeoff, IEEE Internet Computi 1998
- 13 Tim Lindholm , Frank Yellin, Java Virtual Machine Specification, Addison-Wesley Longm. Boston, MA, 1999
- 14 [14] IBM alphaWorks Website. <http://alphaworks.ibm.com>.
- 15 Sara Porat , Bilha Mendelson , Irina Shapira, Sharpening global static analysis to cope v 1998 conference of the Centre for Advanced Studies on Collaborative research, p.19, Nover Toronto, Ontario, Canada
- 16 [16] Press Release. What is the Java 2 Platform, Micro Edition?, June 1999. <http://java.sun.com/features/1999/06/j2me.html>.

- 17 [17] Press Release. Taking it to the streets: Motorola and the K Virtual Machine, June 1
<http://java.sun.com/features/1999/06/moto.html>.
- 18 William Pugh, Compressing Java class files, Proceedings of the ACM SIGPLAN 1999 conference on language design and implementation, p.247-258, May 01-04, 1999, Atlanta, Georgia, United States
- 19 Derek Rayside , Kostas Kontogiannis, Extracting Java Library Subsets for Deployment on Embedded Systems, Proceedings of the Third European Conference on Software Maintenance and Reengineering, May 01-04, 1999, Atlanta, Georgia, United States
- 20 [20] Sun Microsystems. The K Virtual Machine (KVM) White Paper. Technical report, Sun Microsystems, Inc., 1999.
- 21 Frank Tip , Chris Laffra , Peter F. Sweeney , David Streeter, Practical experience with a Java, Proceedings of the 14th ACM SIGPLAN conference on Object-oriented programming, systems, languages, and applications, p.292-305, November 01-05, 1999, Denver, Colorado, United States
- 22 [22] B. Venners. Under the Hood: Bytecode basics. Java World, September 1996.
<http://www.javaworld.com/javaworld/jw-09-1996/jw-09-bytecodes.html>.
- 23 [23] B. Venners. Under the hood: The Java class file lifestyle. Java World, July 1996. <http://www.javaworld.com/javaworld/jw-07-1996/jw-07-classfile.html>.
- 24 [24] B. Venners. Under the hood: The lean, mean, virtual machine. Java World, June 1996. <http://www.javaworld.com/javaworld/jw-06-1996/jw-06-vm.html>.

⬆ CITINGS 5

Nik Shaylor , Douglas N. Simon , William R. Bush, A java virtual machine architecture for v6, SIGPLAN Notices, v.38 n.7, July 2003

Mario Latendresse , Marc Feeley, Generation of fast interpreters for Huffman compressed by 2003 workshop on Interpreters, Virtual Machines and Emulators, p.32-40, June 12-12, 2003

Lars Ræder Clausen , Ulrik Pagh Schultz , Charles Consel , Gilles Muller, Java bytecode compact for embedded systems, ACM Transactions on Programming Languages and Systems (TOPLAS), v.24 n.6, p.625-666, November 2000

Derek Rayside , Kostas Kontogiannis, Extracting Java library subsets for deployment on embedded systems, Computer Programming, v.45 n.2-3, p.245-270, November 2002

Frank Tip , Peter F. Sweeney , Chris Laffra , Aldo Eisma , David Streeter, Practical extraction of Java library subsets for deployment on embedded systems, Transactions on Programming Languages and Systems (TOPLAS), v.24 n.6, p.625-666, November 2000

⬆ INDEX TERMS

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↪ D.3.2 Language Classifications

↪ Nouns: Java

↪ D.4 OPERATING SYSTEMS

↪ D.4.7 Organization and Design

↪ Subjects: Real-time systems and embedded systems

General Terms:

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